

From the ashes will rise a habitat for
a modern phoenix — the Kirtland's Warbler.

Michigan's Bird of the Jack Pine



KIRTLAND'S
WARBLER

ADMINISTRATIVE USE

USDA-FOREST SERVICE
MIO RANGER DISTRICT
401 COURT STREET
MIO MI 48647



Cover art created and donated by Lyla Messick

Cover Legend: Males on left, females on right;

Plumages, from top to bottom:

Adult summer, adult winter, immature, juvenile.

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April, 1992



TO CARE FOR LIFE IS TO CARE FOR THE LEAST



The Kirtland's warbler (*Dendroica kirtlandii*) is one of the rarest members of the wood warbler (*Parulidae*) family. Even though it is a bird of unusual interest for many reasons, this yellow-breasted songster's fame among ornithological circles and elsewhere is largely due to its rarity.

Owing to its restricted range and its exacting habitat requirements, this warbler has probably always been a rare species. It was not until 1851 that it was discovered and described by scientists as a species. A male was taken on May 13, 1851 near Kirtland's farm on the outskirts of Cleveland, Ohio, and sent to the Smithsonian Institution in Washington. The species was named in honor of Dr. Jared P. Kirtland, physician, teacher, horticulturist and naturalist who authored the first lists of birds, mammals, fishes, reptiles, and amphibians of Ohio.

The winter range of the Kirtland's warbler was found when a specimen was collected on Andros Island on January 9, 1879. All sightings or collections of wintering Kirtland's warblers since then have been in the Bahamas, Turks and Caicos, and Hispaniola.

It was not until July of 1903 that the nesting grounds were found in northern Lower Michigan. Norman A. Wood searched for and found the first nest. It was located in Oscoda County about one-half mile east of the Crawford County line and a mile north of the Au Sable River. Every nest that has been found since has been within 60 miles of this spot.

habitat



One characteristic of the Kirtland's warbler that has added to the interest in the bird is its very restrictive habitat requirements. This warbler nests only in young jack pine stands which are usually over 80 acres in size. Such habitat is known to have been present in the conifer zone on the sandy outwash plains in the wake of the Wisconsin Ice Sheet. This conifer zone was a comparatively narrow strip across the North Central States, and the amount of this specific habitat suitable to the warbler at any one time was probably small.

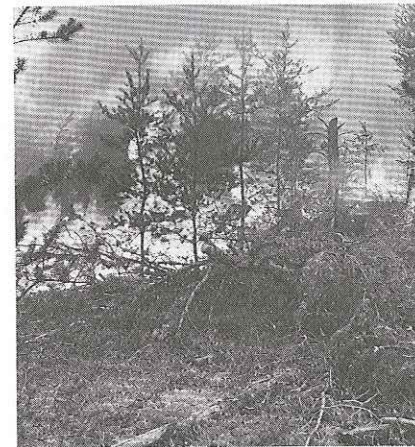
The stands are characterized by having dense clumps of trees interspersed with numerous small grass and sedge openings. The birds nest on the ground, in openings or under the branches of small trees. The birds will begin nesting in such stands when the trees are 5 feet

high, or about 8 years of age, and continue until the lower branches of the trees start dying. This occurs about the time the trees reach a height of 16 to 20 feet, at about 20 years of age. A breeding pair of warblers requires about 30 to 40 acres of this habitat type within a larger stand for their nesting territory, although as little as 8-10 acres per pair may suffice under optimal conditions.

Under natural conditions, the type of young jack pine stands that provide Kirtland's warbler nesting habitat are produced by fire. However, these birds will use jack pine, and rarely, red pine, plantations if the trees are planted in the proper configuration.

Another important aspect of Kirtland's warbler ecology is the type of soil upon which the nesting habitat occurs. Nearly all of the stands

where the warbler nests are on Grayling Sand. This is an extremely well-drained sandy soil with low humus and nutrient content. The significance of this soil to the Kirtland's warbler is that it apparently produces the plant community required for nesting habitat, and that water percolates through this soil so fast that nests are seldom flooded during a rain storm.



Fire has always occurred in the jack pine forest. It is because of fire that jack pine and the Kirtland's warbler exist today. Heat from fire is needed to open jack pine cones to release the seed. Fire also prepares the ground for the germination of the seed.

Fires in prehistoric days were undoubtedly fewer, but were more extensive. They produced the jack pine "plains" that the lumbermen found as they moved across Lower Michigan in the last century. Logging and burning increased the area of jack pine, making more nesting habitat available to the Kirtland's warbler at the turn of the century than at any other time. Observations indicate that the Kirtland's warbler was at a peak between 1890 and 1910.

Fire protection is a necessity in forest land management. However, with the advent of fire protection and other forest management practices, there has been a drastic decline of available warbler nesting habitat. Kirtland's warbler numbers in the past few decades have been a fraction of their peak population.

Recognizing that modern forest management did not provide for this declining species, the Forest Service and Michigan Department of Natural Resources, between 1957 and 1962, designated four areas within state and national forests to be managed to produce Kirtland's warbler nesting habitat. The value of these four areas could be seen by the fact that they held 53% of the nesting population in 1973.

It was clear that if this species was to be maintained at a nonendangered level, more of the jack pine stands on the dry sand plains of northern Michigan would have to be managed. During the mid-1970's, some 134,000 acres of jack pine stands were designated for Kirtland's warbler nesting habitat on 24 management areas within state and national forests. These stands are managed by logging, burning and planting on a rotational basis to provide 36,000-40,000 acres of productive nesting habitat at all times. By carrying these stands to a 50-year rotational age, nesting habitat can be maintained for the warblers with little sacrifice to the commercial harvest of jack pine. Adequate nesting habitat requires stands of 320 acres or more. These jack pine stands also provide important habitat for other species such as the upland sandpiper, sharp-tailed grouse, Eastern bluebird, kestrel, deer and snowshoe hare.

the cowbird



Dow Chemical Co.

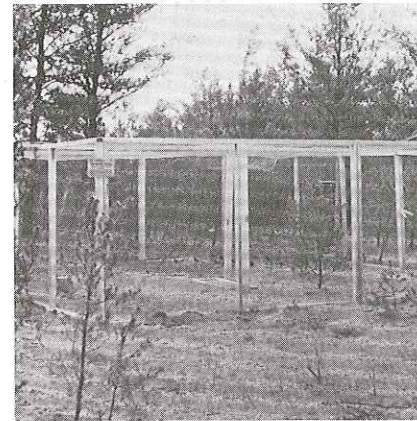
The brown-headed cowbird (*Molothrus ater*) has evolved the unusual behavior of laying its eggs in the nests of other species of birds. This leaves the host birds with the chore of hatching the cowbird's eggs and rearing their young.

The cowbird was originally a bird of the open plains. Before the white man's arrival, forested northern Michigan was outside the cowbird's range. Thus, the Kirtland's warbler evolved without the pressure of cowbird nesting parasitism. As land clearing and farming progressed northward in Michigan, the cowbird spread its range into the newly created habitat. It has fared well and

has adapted to new conditions. In doing so, it has found new species to foster its young, including the Kirtland's warbler. Not having innate defenses against this parasite like other species that evolved with the cowbird, the Kirtland's warbler is an extremely vulnerable host.

The cowbird eggs hatch a day or so before the smaller warbler eggs. The cowbird hatchling is larger and more aggressive than its warbler nestmates, and will get more than its share of food brought to the nest by the adult warblers. With one cowbird in a warbler nest, one to three of the warbler chicks may survive. If two cowbird eggs are laid and

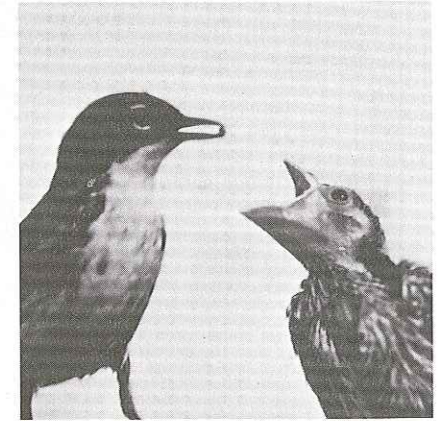
problem



hatched in a warbler nest, none of the warbler chicks will survive. Those that do hatch will soon die, since a warbler chick cannot compete for food with the larger cowbird chicks.

Studies have indicated that the heavy cowbird pressure posed an intolerable burden on the Kirtland's warbler. This is believed to have been a major factor in the pre-1972 decline in its numbers. It could, if unchecked, lead to the extinction of this species.

In an effort to reverse the decline of the Kirtland's warbler, the U.S. Fish and Wildlife Service, in cooperation with the U.S. Forest Service, Michigan Department of Natural Resources (DNR) and Michigan Audubon Society, launched a cowbird control project in 1972. During spring and early summer each year

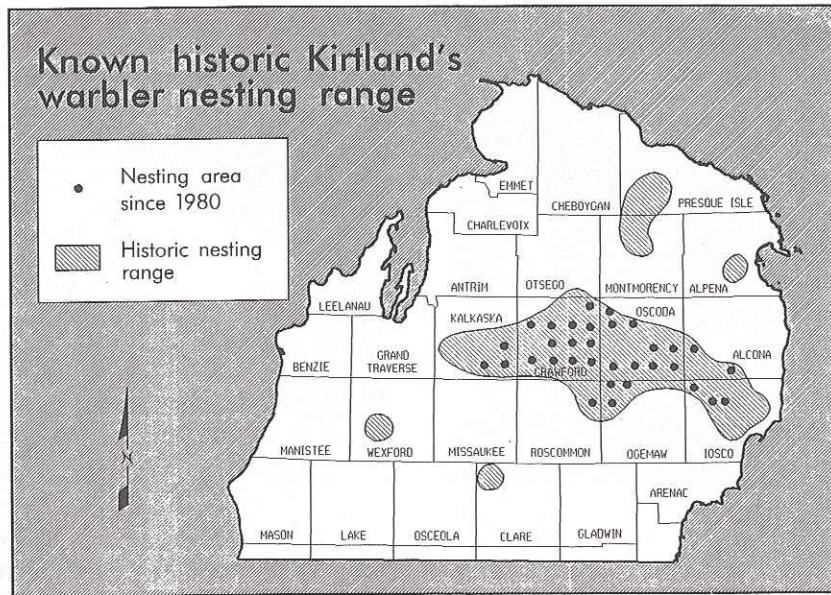


since then, cowbird traps have been operated on Kirtland's nesting areas. The traps, baited with millet and water, and stocked with a few live cowbird decoys, are tended daily. Trapped cowbirds are asphyxiated while other species are banded and released unharmed. Through 1990, 76,530 cowbirds had been removed, an annual average of 4,028.

Kirtland's warbler reproductive success has improved dramatically since cowbird trapping began. The nest parasitism rate has declined from the 1966-71 average of 69% to a 1972-79 average of 4.9%. Average clutch size has increased from 2.34 eggs per nest to more than 4. The average number of young warblers fledged per nest increased from 0.81 to 2.76 during the same period.

populations

additional notes of interest



KIRTLAND'S WARBLER SINGING MALE COUNTS, SELECTED CENSUSES

Location	1951	1961	1971	1974	1980	1981	1983	1987	1990	1991
Michigan Counties										
Alcona	4	0	0	0	0	0	0	1	4	7
Crawford	142	52	101	88	93	72	72	66	59	65
Iosco	74	30	1	0	3	3	1	0	5	0
Kalkaska	28	32	0	0	38	32	15	10	5	7
Marquette	0	0	0	0	0	0	1	0	0	0
Montmorency	43	61	1	0	0	0	2	0	0	0
Ogemaw	0	114	47	35	46	50	42	13	17	35
Oscoda	103	152	48	41	58	67	81	68	166	226
Otsego	0	14	3	0	0	0	0	0	0	0
Presque Isle	34	34	0	0	0	0	0	0	0	0
Roscommon	4	13	0	1	4	8	1	9	9	7
Wexford	0	0	0	2	0	0	0	0	0	0
Michigan Totals	432	502	201	167	242	232	215	167	265	347
Wisconsin	0	0	0	0	1	0	0	0	1	1
Ontario	0	0	0	0	0	0	0	0	1	0
Quebec	0	0	0	0	0	0	0	0	0	0
North American Totals	432	502	201	167	243	232	215	167	267	348

The entire nesting population of the Kirtland's warbler can be censused by counting singing males. Assuming 100% monogamy for census purposes only, the total population can be estimated by doubling the male counts.

Censuses were done in 1951, 1961, and annually since 1971. In recent years, these counts have been expanded to include other dry site jack pine areas in the Great Lakes Region. As a result, unmated males occasionally have been found in Wisconsin, Ontario, Quebec and Michigan's Upper Peninsula between 1977 and 1990. The table on the facing page shows the singing males counted in Michigan and the known total for North America for selected years.

In early spring, the Kirtland's warblers begin their annual trek from their winter home in the Bahamas to their nesting grounds in Michigan. Arriving a few days ahead of the females, sometime between May 3 and May 20, the males immediately establish their territories in the young jack pine stands.

When the females arrive the birds pair off and courtship ensues. Soon after, the female builds her nest of leaves and grass on the ground while the male begins bringing her insects. Most warbler pairings are monogamous, but there are records of one male with two females in the nesting territory. There is also an uncertain proportion, possibly significant, of unmated males. Egg laying starts in late May and the first nest of five eggs is complete in five days. If, for some reason, the first nest is lost, another nest is started shortly thereafter. The male seldom shares the incubation chores, but continues to feed his incubating mate a diet of insects.



Incubation requires 13 to 16 days, and the eggs hatch sometime between June 12 and June 26. Both adults feed the young. The young develop rapidly and are out of the nest by the ninth day. The young spend the first two weeks out of the nest in the undergrowth and lower branches of the jack pines, being fed a diet of insects and occasionally blueberries. By the third week, they begin to gather most of their own food, and by the fifth week parental feeding has ceased. In some instances, the female will begin a second nest while the male feeds the first set of fledglings.

The warblers begin their southward migration in mid- to late-August, apparently with the young of the

year leaving first. By early to mid-October, all have left Michigan. Until recently practically nothing was known about their winter behavior.

The U.S. Fish and Wildlife Service studied the winter range in the Bahamian Archipelago and on the Island of Hispaniola in 1985 and 1986. Results indicated an abundance of stable winter habitat and wide dispersal of wintering birds among the islands. No other problems were apparent on the winter range that would threaten the survival of this species. Consequently, it appears that the major problems of survival for the Kirtland's warbler are occurring in the breeding range, so research emphasis has been re-focused there.

laws & regulations

The Kirtland's warbler, its nests and eggs are given complete protection under Federal law by authority of The Migratory Bird Treaty Act of 1918 and the Endangered Species Act of 1973. Under Michigan law, protection is given by authority of The Wildlife Conservation Act of 1988 and the Endangered Species Act of 1974.

Further, by order of the Director of the Michigan DNR and by order of the Huron National Forest Supervisor under the Secretary of Agriculture's Regulations, KIRTLAND'S WARBLER NESTING AREAS IN THE STATE AND NATIONAL FORESTS ARE POSTED AND CLOSED TO PUBLIC ENTRY BETWEEN MAY 1 and AUGUST 15 or until after Labor Day on selected areas, except by authorized guided tours. The free tours are run from mid-May to early-July. The best period for seeing warblers is during late May and June. No reservations are necessary for individuals or small groups. REMEMBER, the disturbance of plants, birds, nests, and the PHOTOGRAPHY OF NESTS IS STRICTLY PROHIBITED!

TOURS ORIGINATE AT THE FOLLOWING PLACES: (Contact these offices for times, dates, reservations for large groups, and other details.)

Forest Service Ranger Station, Mio, MI 48647 (517/826-3252)
Holiday Inn, Grayling, Michigan 49738 (517/348-7611) (between April 15 and July 4 ONLY, otherwise Fish and Wildlife Service below)

ANSWERS TO SPECIFIC QUESTIONS ABOUT THE KIRTLAND'S WARBLER MAY BE OBTAINED FROM:

Michigan DNR, Natural Heritage Program, Box 30028, Lansing, MI 48909, 517/373-1263

or

U.S. Fish and Wildlife Service, 310 Manly Miles Bldg., 1405 S. Harrison Rd., East Lansing, MI 48823, 517/337-6652

or

Forest Biologist, Huron-Manistee National Forests, 421 S. Mitchell St., Cadillac, MI 49601, 616/775-2421



the recovery plan

Rules promulgated under the Endangered Species Act of 1973 called for the establishment of Recovery Teams to assist the Fish and Wildlife Service in carrying out provisions in the Act. In early 1975, a Kirtland's Warbler Recovery Team was named by the Secretary of the Interior to guide efforts in aiding the warbler. As a result of efforts by the team, a Kirtland's Warbler Recovery Plan was prepared outlining steps designed to increase the species population. The primary objective of the plan is to **"Reestablish a self-sustaining wild Kirtland's warbler population throughout its known former range at a minimum level of 1,000 pairs."** Secondary objectives, designed to accomplish the primary objective, are as follows:

1. DEVELOP and maintain some 36,000-40,000 acres of suitable nesting habitat for the Kirtland's warbler on a sustained basis, through planned rotation cuttings on 140,000 acres of jack pine stands within designated management areas.
2. PROTECT the Kirtland's warbler on its wintering grounds and along the migration route.

3. REDUCE key factors adversely affecting reproduction and survival of the Kirtland's warbler.
4. MONITOR breeding populations of the Kirtland's warbler to evaluate responses to management practices and environmental changes.
5. STUDY the possibility of introducing Kirtland's warblers into areas in the Upper Peninsula of Michigan or in other states or Canadian provinces in an attempt to establish independent self-sufficient populations.

In spite of intensive management and the increased reproductive success, the Kirtland's warbler breeding population has remained essentially stable since 1972. The 1991 census, however, revealed the highest number of singing males since 1961. The amount of available nesting habitat in 1991, both from wild-fire and plantations, was also at the highest level in many years. The survival of this species is still in doubt and will require a continuing effort to provide the habitat and protection it needs. This will happen only as long as there are people who care.



YOU CAN HELP PROTECT THE KIRTLAND'S WARBLER AND ITS NESTING HABITAT:

- 1 Observe the laws and regulations.
- 2 Do not camp in the area. Use nearby campgrounds.
- 3 Stay with the tour guides and follow their instructions.
- 4 Vehicles of all types should be operated only on maintained roads within the area.
- 5 Do not permit children to run and play in the area.
- 6 Keep pets in the car and do not allow them to run.
- 7 Do not use recordings or imitations of Kirtland's warbler songs to attract birds.
- 8 Unnecessary noise, movements and other disturbances have no place in this area and should be avoided.

Public forests provide a wide variety of uses, products, and pleasures for people. They were originally established to protect watersheds and supply timber, and they still do. But in addition, these forest lands are now rich in wildlife and recreation opportunities. These and other uses are managed by the U.S. Forest Service and Michigan Department of Natural Resources. Specialists in many fields coordinate and balance uses so that all Americans will receive maximum benefits throughout the years.

State and National Forest lands dedicated to Kirtland's Warbler Management:

Michigan Department of Natural Resources

Management Areas Within:

Au Sable State Forest
Mackinaw State Forest
Pere Marquette State Forest

U.S. Forest Service

Management Areas Within:

Huron National Forest

U.S. Fish and Wildlife Service

Kirtland's Warbler Wildlife Management Area

